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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/693,614	10/20/2000	Dieter Mueller	81208-246308	8876

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EXAMINER	
LEE, HWA S	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/693,614	Applicant(s) MUELLER ET AL.	
	Examiner Andrew H. Lee	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Groot (6,249,351).

deGroot shows a grazing incidence interferometer, for example Figure 7, comprising:

a low coherence light energy generating device (701);

a collimator (703,706);

a first diffraction grating (705);

a reflective surface (730, 731);

a second diffraction grating (770);

a collimator (771, 773);

a camera (775)

a specimen surface having a predetermined standardized characteristics.

3. de Groot does not expressly say that the light energy passes only over a portion comprising less than half the specimen surface. At the time of the invention, one of ordinary skill in the art would have illuminated a portion that is less than half of the specimen surface. The skilled artisan would have done so for specimens that are large compared to the projection size of the light energy since smaller and cheaper diffraction gratings, lens and cameras can be

used. In addition, it can be interpreted that the top portion of the sample surface is only a small portion of the top, side, and bottom surface which would meet the claim limitation of less than half the specimen surface.. Furthermore, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

As for claim **2, 3, 7, 17, 28, 30,** please see Figure 7, where the reflective surface and specimen receive nonzero order light.

As for claims **4, 8, 18, 32, 35**, please see column 5, lines 6+ and column 4, line 44.

As for claims **5**, please see camera (175 or 475) and column 9, lines 53+.

As for claim **6**, the receiving collimator comprises at least one lens.

As for claims **9, 10, 11, 15, 21,22, 24, 37, and 39**, it is well known in the art to translate either the sample or the measuring apparatus for surface scanning the sample for global planarization and dishing.

As for claim **12,** , at the time of the invention, one of ordinary skill in the art would have tested unpatterned wafer with film as suggested by de Groot.

As for claim **13, 23, and 38**, at the time of the invention, on of ordinary skill in the art would be motivated to have the measuring apparatus incorporated in any system including a CMP processed wafer production line where surface profile measurements are desired and it is well known in the art that surface profiles of wafers during production is desired as shown by de Groot.

As for claim **19**, Official Notice is taken that initial calibrating of interferometers (are/is) old and well known in the art. See In Re Malcolm 1942 C.D.589: 543 O.G.440. At the time of the invention, one of ordinary skill in the art would have calibrated the measuring interferometer in order to obtain accurate, consistent, and repeatable measurements caused by imperfect optical components of the interferometer or temperature fluctuations.

As for claim **20 and 33**, please see column 4, lines 60+.

As for claim **29 and 34**, please see collimator 103.

As for claim **31**, please see elements 170, 171, 173.

Response to Arguments

4. Applicant's arguments filed 7/28/03 have been fully considered but they are not persuasive.

5. In response to applicant's argument that de Groot does not mention CMP wafers or the issues associated therewith, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that de Groot does not show a "predetermined standardized characteristics," the applicant has not limited the definition of what a "predetermined standardized characteristics" is. de Groot shows a sample having a "highly polished surfaces" (column 1, line 14), a sample being a silicon wafer (column 2, line 50-51), or cylinders (column 2, lines 52-53), all of which meets a definition of a "predetermined

standardized characteristic" since the surface has a predetermined standardized characteristic of being smooth, flat, or cylindrical in shape.

In response to applicant's argument the "said first diffraction grating passes light energy only over a portion of the specimen surface having predetermined standardized characteristics, said portion comprising less than half of the specimen surface," the applicant did not claim that it is a single combined limitation. Furthermore, in response to applicant's argument that de Groot does not show the limitation, the examiner did not solely rely on de Groot for the teaching of the limitation, but rather the combination of the prior art was relied upon, thus meeting the claimed limitation.

In response to Applicant's request for the Examiner to cite a reference showing "passing light energy only over a portion of the specimen surface having a predetermined standardized characteristics, said portion comprising less than half of the specimen surface," the examiner cites US 4,030,830 to Holly. Holly shows an interferometric surface profiler that scans large surfaces by passing light energy only over a portion of the specimen surface having a predetermined standardized characteristics (high-prescision smooth surface), said portion comprising less than half of the specimen surface (Abstract).

As for applicant's argument that de Groot does not pass light energy only over a portion of the specimen (Applicant's response, page 9, second paragraph), the examiner cannot find where de Groot teaches that the light passes over the entire specimen. On the contrary, de Groot shows in figure 1, that there are portions of the specimen (outer edges) that is not illuminated by the light.

As for applicant's argument that de Groot does not mention CMP surfaces nor specific problems associated therewith (Applicant's response, page 9, last paragraph), it is noted that the features (CMP surfaces) upon which applicant relies are not recited in the rejected claim(s).

6. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this instance, it is known in the prior art (Holly for instance) for passing light energy over only a portion of large surfaces having a predetermined standardized characteristics (highly polished), wherein the obtained images are stitched together to obtain a complete surface profile of a large specimen.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center numbers are 703-872-9318 for regular communications and 703-872-9319 for After Final communications

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and

b) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa Lee whose telephone number is (703) 305-0538. The examiner can normally be reached on M-Th. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 703-308-4881.

Andrew Lee
Patent Examiner
Art Unit 2877
October 8, 2003/ahl

Frank Font
Supervisory Patent Examiner
Art Unit 2877